

Preliminary Close-Out Report

EPA Region 5 Records Ctr.



305472

Beloit Corporation Superfund Site Rockton, Illinois

September 2008
Prepared By:



Region 5
United States Environmental Protection Agency
Chicago, Illinois

Approved by:

Date:

A handwritten signature in black ink that reads "Richard C. Karl". The signature is written in a cursive, flowing style.

Richard C. Karl, Director
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9.29.08

SUPERFUND PRELIMINARY CLOSE - OUT REPORT
Beloit Corporation Site
Rockton, Illinois

I. INTRODUCTION

This Preliminary Closeout Report documents that the construction activities for the Beloit Corporation Superfund Site have been completed in accordance with the Closeout Procedures for the National Priorities List Sites (OSWER Directive 9320.2-09 A-P).

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, the remedial investigation efforts and construction of the selected remedial action for the site have been completed. The Record of Decision (ROD) for the Beloit Corporation Site was signed in September 2004. The selected remedial action contained in the ROD is a final, site wide remedy that addresses the groundwater and soil contamination at the site. The ROD specifies that the primary remedy for the site is the existing Interim Source Control Action (ISCA) pump and treat system, which is to be augmented by chemical oxidation of groundwater and soil in the Erection Bay source area, and the installation of additional extraction wells, as necessary.

During the design phase, a source area investigation (SAI) was conducted in 2006 to further delineate the source area in the vicinity of the Erection Bay. The results indicated that the source area was more than five times originally estimated, the soil conditions would significantly decrease the expected efficiency and effectiveness of the chemical oxidation. Due to the reduced effectiveness and significant increase in cost necessary to chemically oxidize the source area contamination, an Explanation of Significant Difference was issued in September 2007 modifying the remedy to replace chemical oxidation with enhanced groundwater extraction utilizing hydraulic fracturing. The modification also included the installation of additional extraction wells in the source area.

II. SUMMARY OF SITE CONDITIONS

Background

The Beloit Corporation - Blackhawk Facility (the site) is located in Rockton Township, in north-central Illinois. The site was proposed for the National Priorities List (NPL) on June 24, 1988 and was placed on the NPL on August 30, 1990. The site occupies part of the northern half of Section 13 and the southeast quadrant of Section 12, T46N, R1E, Winnebago County, Illinois (See Figure 1).

In the 1990s Beloit Corporation performed a complete Remedial Investigation (RI) and Feasibility Study (FS) with oversight by the Illinois EPA. Volatile Organic Contaminants (VOCs), primarily PCE and 1,1,1-trichloroethane (1,1,1-TCA), were found in the groundwater originating on Beloit Corporation property and extends into the Village of Rockton and the southern portion of the Blackhawk Acres subdivision. The use of solvents for cleaning of machine parts at the Beloit Corporation plant was identified as the source of groundwater contamination. VOCs released from the vicinity of the Erection Bay have migrated in the groundwater to the southwest essentially parallel to the Rock River. A second TCE plume located deeper within the shallow aquifer originates near the southeast corner of the Beloit Corporation property and also extends into the Village of Rockton. Currently the site is under new ownership and is used as a transfer station for drywall and other building supplies.

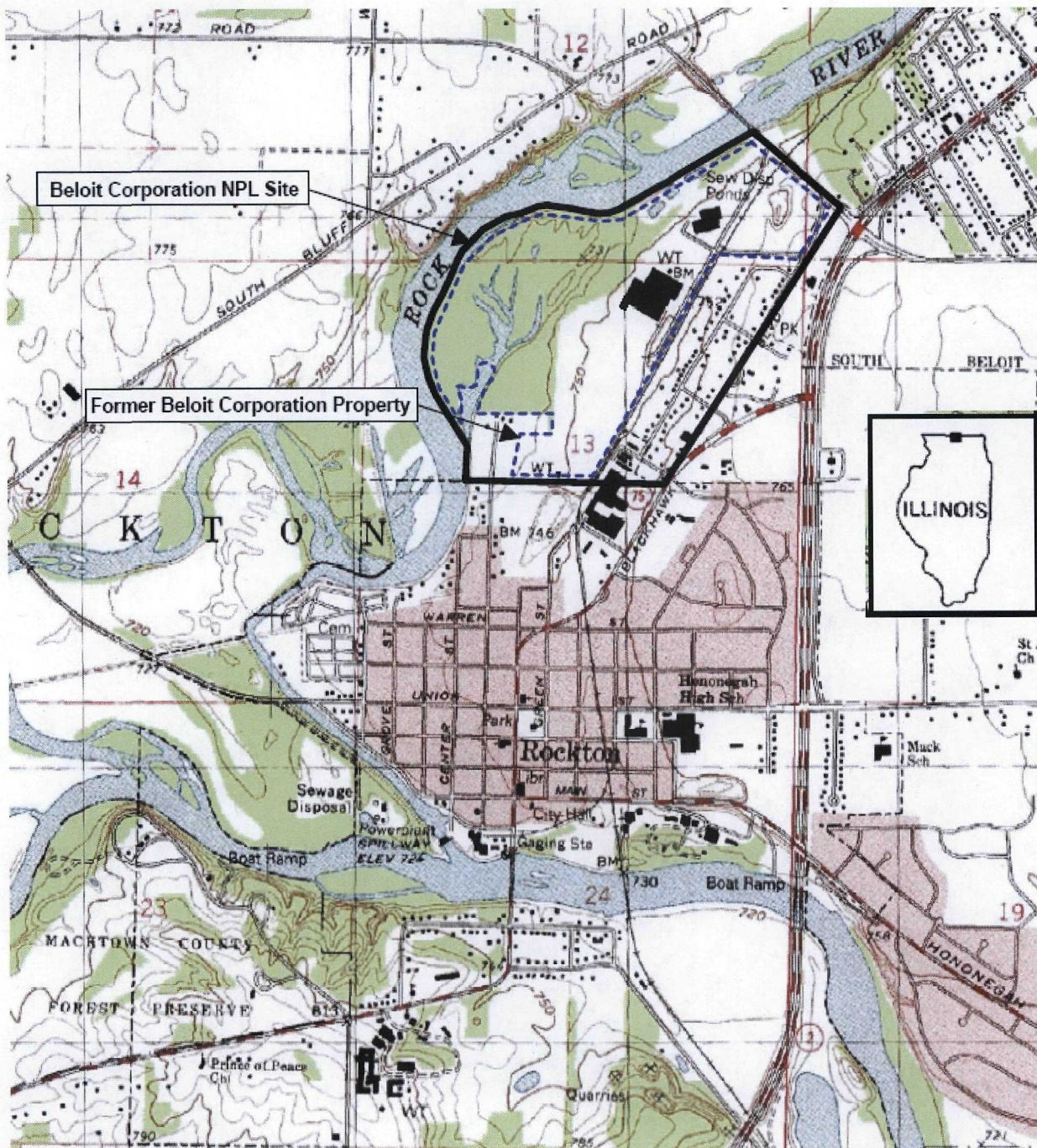


Figure 1
Site Location Map, Beloit Corporation Site

Source: U.S.G.S., South Beloit, Il-Wis 7.5' Quadrangle, 1993.

In 1993, the Illinois EPA installed point-of-entry carbon filtration units in residences with impacted wells in the Blackhawk Acres subdivision. An Interim Source Control Action (ISCA) pump and treat system was installed in 1996 on Beloit property, and groundwater flow on the property and along the southwest side of the Blackhawk Acres subdivision was captured by the extraction wells, preventing further off-property migration of VOCs. VOCs within the capture zone of the ISCA pump and treat system are removed by air stripping. The VOCs outside the capture zone continue to migrate toward the Rock River south of the village. Dilution, sorption, and degradation attenuate VOC concentrations throughout the 4,600-foot flow path from the south end of the NPL site to the Rock River. Figure 2 shows pertinent features of the NPL site.



During the RI, soil, soil gas, and groundwater quality data was gathered by Montgomery Watson Americas, Inc., consultant to the Beloit Corporation (Montgomery Watson 1999). Due to soil and groundwater concentrations of PCE in monitoring wells W23/W23B and W36C, the southern area of the Erection Bay is believed to be the source area for the On-Property Groundwater Plume. High levels of PCE in groundwater have been persistent at this location, despite implementation of the ISCA pump and treat system and placement of an extraction well (EW01) in the vicinity. In the RI report, Montgomery Watson estimated the dimensions of the Erection Bay source area (groundwater VOCs in excess of 1,000 micrograms per liter [$\mu\text{g/L}$]) to be approximately 100 feet by 120 feet (12,000 square feet), and conservatively estimated that the plume in this area extends to a depth of 60 feet below ground surface (BGS). Figure 3 identifies the extent of the groundwater contaminant plumes identified in the RI report.

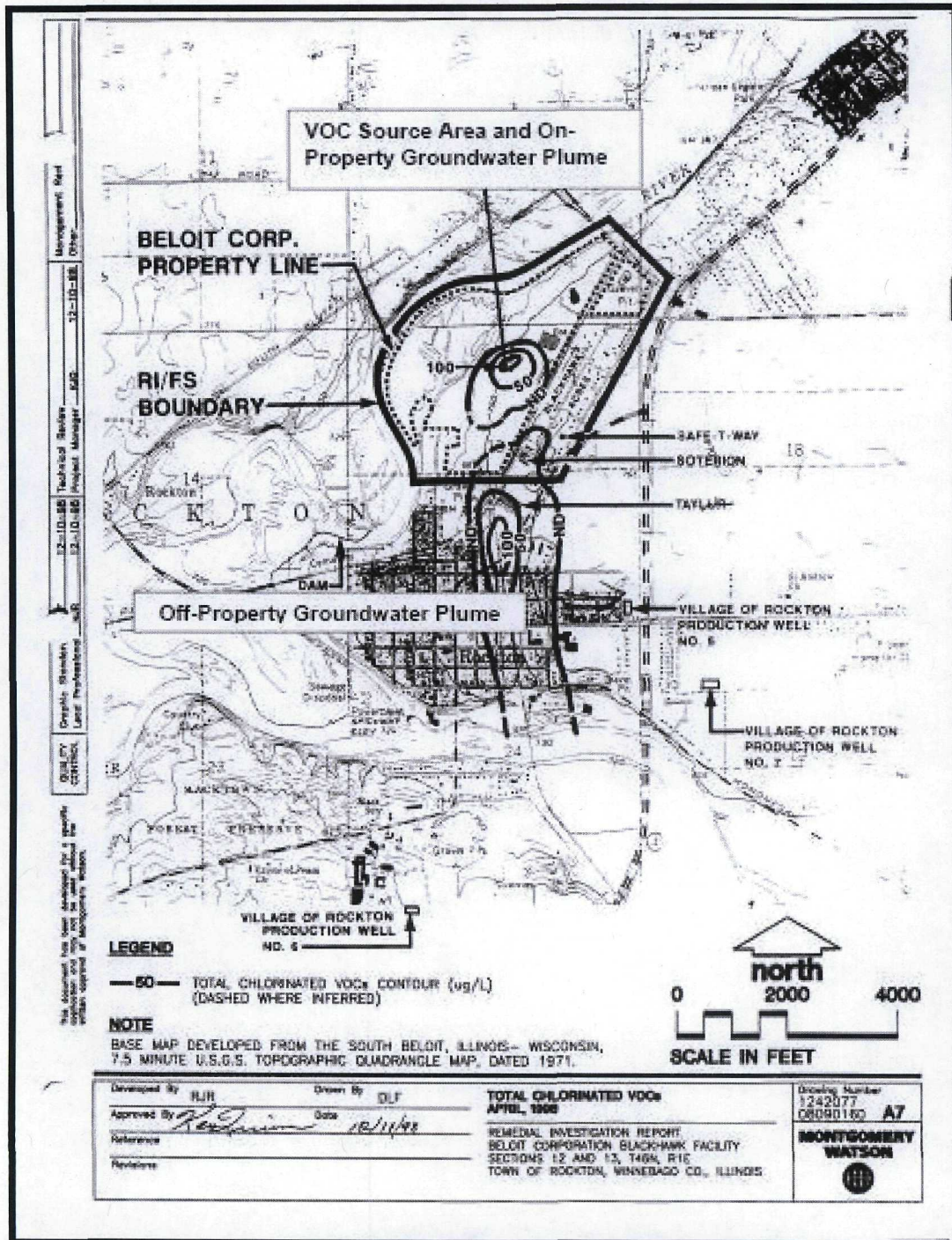
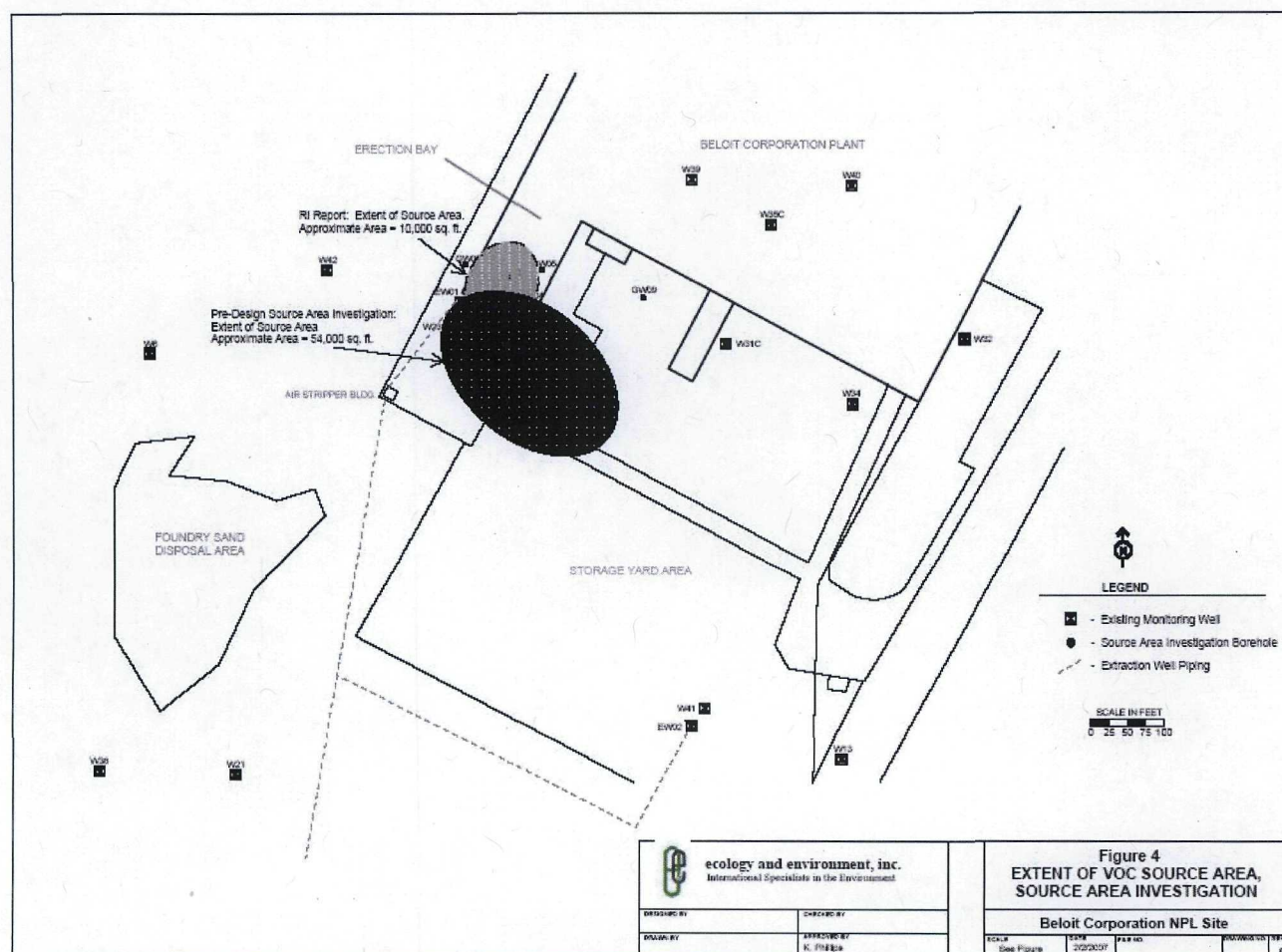


Figure 3. On-Property and Off-Property Plume Locations

The ROD for the Beloit Corporation NPL site specified continuation of the ISCA pump and treat system as the primary remedy to address contaminated groundwater on site, and to prevent further migration of contaminated groundwater to off-site residential wells in the Blackhawk Acres subdivision or in the Village of Rockton. The selected remedy also specified treatment of the source area on the Beloit Corporation property (i.e., chemical oxidation in the Erection Bay area) in order to minimize the overall remediation time frame. Other efforts required by the ROD included Institutional Controls to prohibit the installation of potable water wells on Beloit Corporation property, the establishment of a Groundwater Management Zone (GMZ) pursuant to Illinois Administrative Code Title 35, § 620.250 (2008) for the contaminated groundwater plumes, and monitored natural attenuation of the off-site portion of the plume until the contaminant concentrations are below groundwater standards.

The design and implementation of the remedy was conducted by IEPA through a cooperative agreement. During design efforts, a source area investigation (SAI) was conducted in December 2006 in the vicinity of the Erection Bay to delineate the area where groundwater VOC concentrations were the highest. The results from the SAI identified several factors that impacted the implementability, effectiveness, and cost of chemical oxidation as a treatment tool for the source area. The SAI found that the source area was more than five times larger than the area identified in the RI (See Figure 4) and the source area soils were found to be highly consolidated and extremely dense with relatively low permeability. These factors combined would have increased the costs to adequately treat source area soils by a factor of six.



Due to the findings of the SAI, treating the source areas by in-situ chemical oxidation was re-evaluated and an Explanation of Significant Difference (ESD) was issued on September 27, 2007 modifying the remedy. The ESD removed the requirement for in-situ chemical oxidation and required the installation of additional groundwater extraction wells supplemented with hydraulic fracturing of the surrounding soil formation.

Remedial Design efforts were completed between October 2007 and March of 2008. During this time, ownership of the property changed hands with expectations of re-development. IEPA raised concerns that they did not ensure sampling of the new wastewater lagoons during the RI and therefore could not be assured that re-development was appropriate in this area. To expeditiously resolve these concerns, EPA directed its contractor to conduct sampling of the water and sediment in the waste water lagoons to evaluate the need for additional actions.

In February 2008, six surface water samples and twenty sediment samples were taken from the two lagoons (See Figure 5). Surface water samples were analyzed for: Target Analyte List (TAL) metals, Target Compound List (TCL) Volatile Organic Contaminants (VOCs), semi-VOCs (SVOCs) polychlorinated biphenyls (PCBs), pesticides and other general analysis required for evaluating appropriate disposal options. Sediment samples were analyzed for: TAL metals, TCL VOCs, SVOCs, PCBs, pesticides, and Toxicity Characteristic Leaching Procedure (TCLP) metals. To quickly evaluate the sampling results, conservative screening criteria were developed to identify the significance of possible contamination. The most conservative contaminant-specific criterion among various health-based criteria was selected for comparison to the sampling results. Table 1 identifies the sources of the screening criteria. Table 2 summarizes the results of the sampling efforts and comparison against the developed contaminant specific screening criteria.

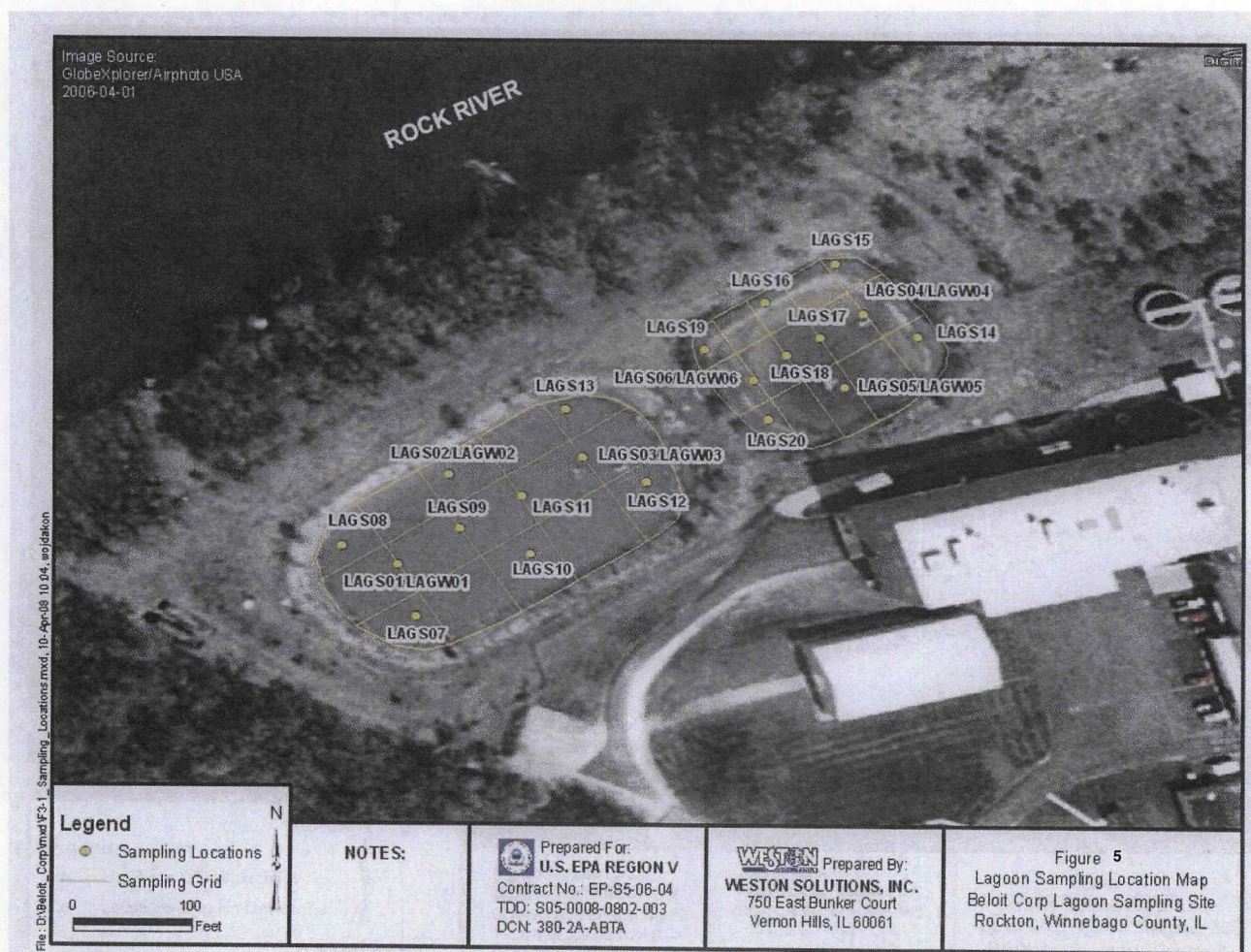


Table 1. Wastewater Lagoon Sampling Screening Criteria Sources	
Surface Water	U.S. EPA National Primary Drinking Water Regulations: Maximum Contaminant Levels (2003)
	U.S. EPA Region 9 Preliminary Remediation Goals (PRGs): Direct Contact Exposure Pathway-Tap Water (2004)
	35 Illinois Administrative Code (IAC) 742, TACO, Appendix B, Table E: Tier I Groundwater Remediation Objectives for the Groundwater Component of the Groundwater Ingestion Route, Class I (2007)
	National Pollutant Discharge Elimination System (NPDES) Requirements
Sediment	U.S. EPA Region 9 PRGs: Direct Contact Exposure Pathway-Residential Soil and Soil Screening Levels (SSLs): Migration to Groundwater – DAF 20 (2004)
	40 CFR 261.24 Table 1: Maximum Concentration of Contaminants for the Toxicity Characteristic (Compliance Guide, 1992-1993)
	35 IAC 742, TACO, Appendix A, Table G: Concentrations of Inorganic Chemicals in Background Soils – Counties within Metropolitan Statistical Areas (2007)
	35 IAC 742, TACO, Appendix B, Table A: Tier I Soil Remediation Objectives for Residential Properties – Ingestion, Inhalation, and Soil Component of the Groundwater Ingestion Exposure Pathway (2007)
	35 IAC 742, TACO, Appendix B, Table C: pH Specific Soil Remediation Objectives for Inorganics and Ionizing Organics for the Soil Component of the Groundwater Ingestion Route, Class I (2007)

Table 2. Summary of Wastewater Lagoon Surface Water and Sediment Sampling		
	Lagoon Surface Water Samples	Lagoon Sediment Samples
TCL VOCs	< Detection Limits ¹	< Detection Limits ¹ (except Acetone < Screening criteria)
TCL PCBs	< Detection Limits ¹	< Detection Limits
TCL Pesticides	< Detection Limits ¹	< Detection Limits ¹
TCL SVOCs	< Detection Limits ¹	< Detection Limits ¹
TAL Metals	< Screening Criteria	< Screening Criteria
TCLP Metals		< Screening Criteria ²

¹ Note: Several detection limits were above screening criteria for individual contaminants. Since all detection limits were less than two orders of magnitude greater than the screening criteria, which were set conservatively at 1×10^{-6} for unlimited use and unrestricted exposure, contaminants present at concentrations in excess of 1×10^{-4} risks would have been detected.

² Note: All locations for Manganese and two locations for lead exceeded the TCLP metal criteria. However none of the samples exceeded the pH Specific Soil Remediation Objectives. Therefore the results are not considered exceedances.

The results of the wastewater lagoon sampling did not indicate any significant contamination. All results were below detection limits with the exception of TAL metals and TCLP metals, with the results of both analyses being below the selected screening criteria. The detection limits for several contaminants were higher than the conservative screening criteria. However none of the detection limits were greater than two orders of magnitude of the screening criteria which were set at 1×10^{-6} , therefore the results indicate that contamination was not present in excess of 1×10^{-4} for any contaminant and any single location. Therefore, the wastewater lagoons were not found to be contaminated at levels that would present unacceptable risks for unlimited use and unrestricted exposure.

Remedial Construction Activities

Construction activities began in July, when Bodine Environmental Services, Inc. under contract to IEPA mobilized to the site. The groundwater pump and treat building was expanded to accommodate the increase in the volume of extracted groundwater. Three new groundwater extraction wells were installed and one extraction well (EW01) was shutdown to adjust the zone of groundwater extraction to better target the source area. Hydraulic fracturing was completed at the three new extraction wells. The new wells were connected to the treatment system and the system was tested to ensure adequate operation.

A site inspection was conducted on September 26, 2008. The site inspection noted that the extraction well locations have been pneumatically fractured, extraction wells have been drilled, developed, and connected to the treatment system. The treatment system building has been expanded to handle the increased flow from the extraction wells. The extraction wells were installed and connected to the treatment system. Pneumatic fracturing was successful and increased the volume of water able to be pumped out by the extraction wells in the source area.

III. Demonstration of Cleanup Activity, Quality Assurance and Quality Control

Both the U.S. EPA and IEPA reviewed the remedial action for compliance with quality assurance and quality control (QA/QC) protocols. Construction activities at the site were determined to be consistent with the ROD and RD/RA plans and specifications. All confirmatory inspections, independent testing, audits, and evaluations of materials and workmanship were performed in accordance with the RD/RA plans and specifications. Construction quality assurance was provided by Bodine Environmental, Inc. The IEPA Manager and EPA Remedial Project Manager have routinely visited the site to review progress of the remedy. Deviations to the plans and specifications were properly documented.

Environmental sampling has been conducted under a Quality Assurance Project Plan (QAPP) specifying appropriate sampling and analytical techniques. The EPA and the State have determined that analytical data are accurate to the degree necessary to assure satisfactory execution of the RA.

IV. Activities and Schedule for Site Completion

The groundwater containment, recovery, treatment and discharge system will continue until the remedial goals specified in the ROD are met. Once these goals have been achieved, the system will be shut down. At a minimum, groundwater monitoring will be conducted until it can be determined that groundwater under and adjacent to the Beloit Site has met drinking water standards. Additionally, Five-Year Reviews will be required every five years to evaluate the effectiveness and protectiveness of the remedies selected. The following activities remain for the Beloit Site:

Task	Estimated Completion	Responsible Organization
1) Quarterly Groundwater Monitoring	Yearly	IEPA
2) Policy Five-Year Review	Five years from PCOR	IEPA/EPA
3) Residential Well Sampling	Yearly	IEPA
4) Implement Institutional Controls	Develop an IC Plan – 2009	IEPA
5) Establish a GMZ for contaminated groundwater plumes	2009	IEPA

Task	Estimated Completion	Responsible Organization
6) Final Close Out Report (FCOR)	Upon achieving remedial goals specified in ROD	IEPA
7) Deletion from NPL	Upon completion of the FCOR	IEPA/EPA

V. Summary of Remediation Costs

The ROD estimated the costs of the selected remedy to be:

Capital costs - \$ 1,123,000

Annual O&M - \$ 92,000

VI. Five-Year Review

A policy Five-Year Review is required for this site until the cleanup objectives are achieved. The first policy Five-Year review is due five years after the signature of this PCOR.